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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,763	07/15/2003	Masaru Takeuchi	116267	5999

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EXAMINER

MOUTTET, BLAISE L

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/618,763	TAKEUCHI, MASARU	
	Examiner	Art Unit	
	Blaise L Mouttet	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-21 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/13/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant's claim for foreign priority is acknowledged. The foreign priority papers were received November 13, 2003.

Information Disclosure Statement

2. The IDS submitted November 13, 2003 has been considered by the examiner.

Drawings

3. The drawings are objected to as follows:

In figures 2 and 3 the reference numerals 2 and 3 for the "CPU" and "ROM" as referred to in the description are missing.

In figure 8 "REEORDING HEAD 15" should read --RECORDING HEAD 15--.

Figures 9A-9C should be designated by a legend such as --Prior Art -- because only that which is old is illustrated as discussed in the related art section of the disclosure. See MPEP § 608.02(g).

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective

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action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 4 and 9 are objected to as follows:

Claim 4 is objected to because it is initially unclear whether this claim is meant to depend from claims 3 or 8 due to the poor quality of the type in which the claims were submitted. However, in light of paragraph [0020] of the written description it appears this claim is meant to depend from claim 3. For purposes of examination under 35 USC 102 and 35 USC 103 claim 4 is interpreted so as to depend from claim 3. The examiner suggests using a finer type in any future claim amendments to avoid possible publication errors at time of issue.

In claim 9, lines 17 and 20-21 "the first product" and "the second product" should more properly be referred to as --a first product-- and --a second product-- since these are new limitations.

Correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 7-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7, lines 9-11 recites "...into an integer as a quotient and a remainder whose absolute value is smaller than the smallest unit amount of feeding of the recording medium...". The meaning of this section of the claim and its relationship to the prior claim limitations is unclear. Based upon a review of the specification, claim 7 appears to correspond to subject matter described in relation to figure 6. The determination of the difference and the dividing of the difference by the smallest amount of the recording medium that can be fed is seen to correspond to the subject matter described in paragraphs [0122] of the specification. However there is no further discussion of a remainder in relationship to these calculations and, in contrast, the result of the division is taught to be rounded off. Claim 7 additionally claims that an accumulated error is determined based upon a product of the remainder and one plus a number of times by which the feeding device has fed the recording medium. In light of paragraph [0123] of the description it appears that it is the unit error R , as opposed to a remainder, which is used to determine the accumulated error. It is unclear how unit error R corresponds to a remainder when it is taught to be calculated as a difference and not as a remainder of a process of division as claimed.

In claim 9, line 2 "the first and second integers" are referred to however, while one integer is referenced in claim 7, the meaning of this integer is unclear as noted

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above and no "first and second integers" were previously claimed or are identifiable based upon a review of the specification.

Since it is unclear what "the integers" and "remainder" as claimed correspond to and how they relate to the claimed calculations the limitations concerning the integers and remainder can not be considered under 35 USC 102 and 35 USC 103.

However, in order to advance prosecution, the rest of the limitations of claims 7-9 will be examined under 35 USC 102 and 35 USC 103 based upon the related description of figure 6 in which it is a unit error calculated using the actual and calculated feeding amounts, rather than a remainder, that is used to determine the accumulated error.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 2, 11-13, 16-18 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawamata et al. EP 1 195 248 A1.

Kawamata et al. discloses, regarding claim 1, a serial recording apparatus (figure 1) comprising:

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a feeding device (described in paragraph [0018]) including a feeding roller (24) and a drive source (feed motor) which rotates the feeding roller and thereby feeds a recording medium (12) in a feeding direction (A);

a recording head (any one of the printheads 22K-22Y as described in paragraph [0016]) which records an image on the recording medium (12) when the recording head is moved in a recording direction (B, C) substantially perpendicular to the feeding direction (A) (paragraph [0018]) and includes at least one array of recording elements (ink jet nozzles) arranged in a direction intersecting the recording direction (as understood in view of figure 5 and paragraph [0024] the nozzles are arranged in direction A); and

a control device (a CPU as described in paragraphs [0031-0033]) which controls, based on a length of the array of recording elements in a feeding direction (corresponds to the average nozzle width detected by Kawamata et al. as described in paragraph [0031]) and an effective diameter of the feeding roller (corresponds to the average actual feed detected by Kawamata et al., the actual feed amounts are taught to result from shape characteristics of the feed roller in such a fashion that the shorter radius of the roller will produce a smaller feed and the longer radius of the roller produces a larger feed as described in paragraph [0035] thus the actual feed measured is operatively related to the feed roller diameter), an amount of operation of the drive source, and thereby controls an amount of feeding of the recording medium in the feeding direction (paragraph [0032]).

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Regarding claim 2, as indicated in paragraph [0009] the feeding device repeatedly feeds the recording medium to print plural bands and therefore the compensation value calculated by the control device would equally be applied to each band printed.

Regarding claims 11, 16 and 21, the recording head is inkjet and the array of recording elements are an array of inkjet nozzles (paragraph [0016]).

Regarding claims 12 and 13, the method of use is implicit to the structure as described in relation to claims 1 and 2.

Regarding claims 17 and 18, a computer-readable computer product containing a computer program for carrying out the method of claims 12 and 13 is implicit to the control features discussed in relation to paragraph [0020].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamata et al. EP 1 195 248 A1.

Kawamata et al. discloses the subject matter of claims 1, 12 and 17 as explained in the 35 USC 102 rejection above.

Kawamata et al. discloses that the control device (CPU) comprises a correcting portion (as described in relation to paragraphs [0031-0032]) which determines a correction value (amount of compensation) based upon the length of the array of recording elements in the feeding direction (nozzle width) and a provisional amount of feeding of the recording medium (actual feed) obtained based upon the effective diameter of the feeding roller and a reference amount of operation of the drive source (as explained in paragraph [0035]), and corrects, based on the determined correction value, the reference amount of operation of the drive source, so that the feeding feeds the recording medium by a corrected feeding amount corresponding to the corrected amount of operation of the drive source (paragraph [0032]).

Kawamata et al. fails to disclose that the algorithm used in obtaining the correction value is based on a difference between the length of the array and the provisional amount of feeding.

The examiner notes that algebraic manipulation of the algorithm taught by Kawamata et al. results in the following:

Amount of compensation=

$$(\text{theoretical feed} \times (\text{nozzle width}/\text{actual feed})) - \text{theoretical feed (algorithm 1)} =$$
$$\text{theoretical feed}/\text{actual feed} \times (\text{nozzle width} - \text{actual feed}) \text{ (algorithm 2)}$$

which indicates that the algorithm employed by Kawamata et al. is **operationally equivalent** to an algorithm utilizing a difference between the length of the array (nozzle width) and provisional amount of feeding (actual feed).

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It would have been obvious for a person of ordinary skill in the art at the time of the invention to program the CPU of Kawamata et al. to utilize algorithm 2 to calculate the amount of compensation instead of algorithm 1 to calculate the compensation since these algorithms are shown to be operationally equivalent producing the same result with the same inputs and there is no functional difference produced by using different algorithms (see MPEP 2106 Section VI which indicates that a computer processor that differs from the prior art solely with respect to non-functional limitations that can not alter how the computer processor functions may properly be rejected under 35 USC 103).

8. Claims 5, 6, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamata et al. EP 1 195 248 A1 in view of Kono et al. JP 07-314838¹.

Kawamata et al. discloses the subject matter of claims 2, 13 and 18 as explained in the 35 USC 102 rejection above.

Kawamata et al. fails to disclose that the control device comprises a correcting portion which determines or a step which determines, each time the feeding device feeds the recording medium, an accumulated error of feeding of the recording medium by the feeding device relative to the recording head, and corrects a reference amount of operation of the drive source into a corrected amount of operation of the drive source, so that the feeding device feeds the recording medium by a corrected feeding amount

¹ Both an English language abstract and translation are provided and relied upon in the rejection.

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corresponding to the corrected amount of operation of the drive source and the accumulated error falls in a reference range.

Kono et al. discloses controlling media feed in a serial inkjet recording apparatus (drawing 1) so that it is determined, each time a feeding device feeds a recording medium (P), an accumulated error (WLFr) of feeding of the recording medium by the feeding device relative to the recording head, and corrects a reference amount of operation of the drive source (WLFm) into a corrected amount of operation of the drive source (WLF), so that the feeding device feeds the recording medium by a corrected feeding amount corresponding to the corrected amount of operation of the drive source and the accumulated error falls in a reference range ($<WLFm$) (As explained in the abstract and paragraphs [0006-0009, 0025-0029] of the English language translation an instructed paper feed amount is converted to a minimum paper feed amount (WLFm) and a fractional remainder of this amount (WLFr) which is summed with the next value of (WLFr) obtained in the next paper feed step to obtain an accumulated value. This value is then converted to a correction quantity (WLFhosei) and a new fractional remainder (WLFr). This process maintains the running error correction to be less than WLFm as noted in paragraph [0009] of the translation.)

Regarding claim 6, when the determined accumulated error does not fall in the reference range (i.e. $WLFr \geq WLFm$) a paper feed correction quantity (WLFhosei) is calculated and added to the minimum feed (WLFm).

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It would have been obvious to a person of ordinary skill in the art at the time of the invention to include the control correction of Kono et al. in addition to the media feed control correction of Kawamata et al.

The motivation for doing so would have been to prevent print media feed errors from accumulating over plural steps by simple processing as taught by paragraph [0009] of Kono et al.

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamata et al. EP 1 195 248 A1 in view of Martin US 4,097,873.

Kawamata et al. discloses the subject matter of claim 1 as described in the 35 USC 102 rejection above.

Kawamata et al. fails to disclose that the inkjet recording apparatus includes a recording mode selecting device which is operable to select one of a plurality of recording modes corresponding to different recording resolutions.

Martin teaches an inkjet recording apparatus including a recording mode selecting device (23) which is operable to select one of a plurality of recording modes corresponding to different recording resolutions (title, abstract, column 6, lines 11-54).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to include a recording mode selecting device as taught by Martin to select a recording mode corresponding to different resolutions in the apparatus of Kawamata et al.

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The motivation for doing so would have been in order to balance printing speed and print quality depending upon the type of printing desired as taught by column 1, lines 29-44 of Martin.

Additional Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ito et al. US 6,126,345 teaches correcting pulses for a recording media feed motor each time the media is advanced based upon a table stored in memory and accumulating the total error between advancement (figure 5).

Hibino et al. US 6,126,346 teaches controlling the number of pulses in a recording media feed motor of a serial recording apparatus based on a diameter of a feed roller.

Askren et al. US 6,428,224 teaches correlating media feed of a print roller with the type/sort of media being fed and using this information to control feeding amounts.

Iwata et al. US 6,520,700 teaches providing measuring devices in a serial printer to measure the surface height and rotation angle of a feed roller and determine recording media feed from this information.

Yamasaki et al. US 6,769,759 teaches correcting the feed of a recording medium during manufacture based on a diameter of a feed roller (column 11, lines 19-35).

Otsuki US 2002/0044290 recognizes the problem of error accumulation in recording media feed for different types of media (figures 8A-11B) and adjusts the media feed to compensate for glossy (slippery) media.

Allowable Subject Matter

11. Claims 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 7-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding claim 4, the examiner notes that while Askren et al. '224 and Otsuki '290 are pertinent to claim 4 in that both teach establishing a correlation between recording media feed amount and the sorts of media being fed this is not seen as combinable with Kawamata et al. to produce the subject matter of claim 4 since Kawamata et al. fails to use a measured diameter of the roller, as claimed in claim 4, and instead uses test printing to obtain the actual feed information related to the effective diameter of the roller. Neither Askren et al. or Otsuki, nor any of the other art of record alone or in combination, provide teachings to remedy this deficiency in such a matter so as to be obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 7-9, the examiner notes that Kono et al. fails to disclose that the correction employs a first correction amount of operation of the drive source when

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the accumulated error is greater than an upper limit of the reference range and a second correction amount of operation of the drive source when the accumulated error is smaller than a lower limit of the reference range. Neither Kono et al. nor any of the other art of record alone or in combination, provide teachings to remedy this deficiency in such a matter so as to be obvious to one of ordinary skill in the art at the time of the invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Blaise Mouttet who may be reached at telephone number (571) 272-2150. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier, Art Unit 2853, can be reached at (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Blaise Mouttet September 10, 2004

Blaise Mouttet 9/10/2004